

Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Original) A method of controlling a permanent magnet turbogenerator/motor comprising the steps of:

providing electrical power to the permanent magnet turbogenerator/motor through a pulse width modulated inverter to start the permanent magnet turbogenerator/motor to achieve self sustaining operation of the permanent magnet turbogenerator/motor;

disconnecting the electrical power from the pulse width modulated inverter once self sustaining operation of the permanent magnet turbogenerator/motor is achieved; and

reconfiguring the pulse width modulated inverter to supply voltage from the permanent magnet turbogenerator/motor.

2. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 1 wherein the voltage supplied from the pulse width modulated inverter of the permanent magnet turbogenerator/motor is utility frequency voltage.

3. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 1 wherein the pulse width modulated inverter includes four solid state switching device channels, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

4. (Original) A method of controlling a permanent magnet turbogenerator/motor comprising the steps of:

providing electrical power to the permanent magnet turbogenerator/motor through a pulse width modulated inverter to drive the permanent magnet turbogenerator/motor as a motor to accelerate the gas turbine engine of the permanent magnet turbogenerator/motor;

providing spark and fuel to the gas turbine engine of the permanent magnet turbogenerator/motor during this acceleration to achieve self sustaining operation of the gas turbine engine;

disconnecting the electrical power from the pulse width modulated inverter once self sustaining operation is achieved; and

reconnecting the pulse width modulated inverter to the permanent magnet turbogenerator/motor through a rectifier bridge to reconfigure the pulse width modulated inverter to supply utility frequency voltage.

5. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 4 wherein the pulse width modulated inverter includes four solid state switching device channels, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

6. (Original) A method of controlling a permanent magnet turbogenerator/motor comprising the steps of:

providing electrical power to the permanent magnet turbogenerator/motor through a first contactor and a pulse width modulated inverter to drive the permanent magnet turbogenerator/motor as a motor through a second contactor to accelerate the gas turbine engine of the permanent magnet turbogenerator/motor;

providing spark and fuel to the gas turbine engine of the permanent magnet turbogenerator/motor during this acceleration to achieve self sustaining operation of the gas turbine engine;

opening the first and second contactors to disconnect the electrical power from the pulse width modulated inverter once self sustaining operation is achieved; and

reconnecting the pulse width modulated inverter to the permanent magnet turbogenerator/motor through a rectifier bridge to reconfigure the pulse width modulated inverter to supply utility frequency voltage.

7. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 6 wherein the pulse width modulated inverter includes

four solid state switching device channels, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

8. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 6 and in addition the step of connecting the reconfigured pulse width modulated inverter to a load by closing a third contactor.

9. (Original) A method of controlling a permanent magnet turbogenerator/motor comprising the steps of:

providing electrical power to the permanent magnet turbogenerator/motor through a first contactor and a multiple solid state switching device channel pulse width modulated inverter to drive the permanent magnet turbogenerator/motor as a motor through a second contactor to accelerate the gas turbine engine of the permanent magnet turbogenerator/motor;

providing spark and fuel to the gas turbine engine of the permanent magnet turbogenerator/motor during this acceleration to achieve self sustaining operation of the gas turbine engine;

opening the first and second contactors to disconnect the electrical power from the multiple solid state switching device channel pulse width modulated inverter once self sustaining operation is achieved;

reconnecting the multiple solid state switching device channel pulse width modulated inverter to the permanent magnet turbogenerator/motor through a high frequency rectifier bridge to reconfigure the multiple solid state switching device channel pulse width modulated inverter; and

connecting the reconfigured multiple solid state switching device channel pulse width modulated inverter to utility power by closing a third contactor.

10. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 9 wherein the number of multiple solid state switching device channels in said pulse width modulated inverter is four, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and

the fourth solid state switching device channels is switched at a fifty percent duty cycle to create an artificial neutral.

11. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 10 wherein the four solid state switching device channels are IGBT channels.

12. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 9 wherein the high frequency rectifier bridge is a three phase rectifier having three diode channels.

13. (Original) The method of controlling a permanent magnet turbogenerator/motor of claim 12 wherein each of said three diode channels include a pair of diodes.

14. (Original) A controller for a permanent magnet turbogenerator/motor, comprising:

a pulse width modulated inverter operably associated with said permanent magnet turbogenerator/motor;

means to provide electrical power to said permanent magnet turbogenerator/motor through said pulse width modulated inverter to start said permanent magnet turbogenerator/motor to achieve self sustaining operation of said permanent magnet turbogenerator/motor;

means to disconnect the electrical power from said pulse width modulated inverter once self sustaining operation of said permanent magnet turbogenerator/motor is achieved; and

means to reconfigure said pulse width modulated inverter to supply voltage from said permanent magnet turbogenerator/motor.

15. (Original) The controller for a permanent magnet turbogenerator/motor of claim 14 wherein said pulse width modulated inverter includes a plurality of solid state switching device channels.

16. (Original) A controller for a permanent magnet turbogenerator/motor, comprising:

a pulse width modulated inverter operably associated with said permanent magnet turbogenerator/motor, said pulse width modulated inverter having four solid state switching device channels;

means to provide electrical power to said permanent magnet turbogenerator/motor through said pulse width modulated inverter to start said permanent magnet turbogenerator/motor to achieve self sustaining operation;

means to disconnect the electrical power from said pulse width modulated inverter once self sustaining operation of said permanent magnet turbogenerator/motor is achieved; and

means to reconfigure said pulse width modulated inverter to supply voltage from said permanent magnet turbogenerator/motor, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

17. (Original) The controller for a permanent magnet turbogenerator/motor of claim 16 wherein said four solid state switching device channels are IGBT channels.

18. (Original) The controller for a permanent magnet turbogenerator/motor of claim 14 wherein the voltage supplied from said pulse width modulated inverter associated with said permanent magnet turbogenerator/motor is utility frequency voltage.

19. (Original) A controller for a permanent magnet turbogenerator/motor having a gas turbine engine, comprising:

a pulse width modulated inverter operably associated with said permanent magnet turbogenerator/motor;

means to provide electrical power to said permanent magnet turbogenerator/motor through said pulse width modulated inverter to drive said permanent magnet turbogenerator/motor as a motor to accelerate said gas turbine engine of said permanent magnet turbogenerator/motor;

means to provide spark and fuel to said gas turbine engine of said permanent magnet turbogenerator/motor during this acceleration to achieve self sustaining operation of said gas turbine engine;

means to disconnect the electrical power from said pulse width modulated inverter and said permanent magnet turbogenerator/motor once self sustaining operation of said gas turbine engine is achieved;

a rectifier bridge operably associated with said pulse width modulated inverter and said permanent magnet turbogenerator/motor; and

means to reconnect said pulse width modulated inverter to said permanent magnet turbogenerator/motor through said rectifier bridge to reconfigure said pulse width modulated inverter to supply utility frequency voltage.

20. (Original) The controller for a permanent magnet turbogenerator/motor having a gas turbine engine of claim 19 wherein said pulse width modulated inverter includes four solid state switching device channels, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

21. (Previously Amended) A controller for a permanent magnet turbogenerator/motor having a gas turbine engine and a permanent magnet generator/motor, comprising:

a pulse width modulated inverter operably associated with said permanent magnet turbogenerator/motor, said pulse width modulated inverter having a plurality of solid state switching device channels;

a first contactor operably associated with said pulse width modulated inverter;

a second contactor [operable] operably associated with said [the] permanent magnet turbogenerator/motor;

means to provide electrical power to said pulse width modulated inverter through said first contactor when closed to drive said permanent magnet turbogenerator/motor as a motor through said second contactor when closed to accelerate said gas turbine engine of said permanent magnet turbogenerator/motor;

means to provide spark and fuel to said gas turbine engine of said permanent magnet turbogenerator/motor during this acceleration to achieve self sustaining operation of said gas turbine engine;

means to open said first and second contactors to disconnect the electrical power from said pulse width modulated inverter once self sustaining operation is achieved;

a rectifier bridge operable associated with said pulse width modulated inverter and said permanent magnet turbogenerator/motor;

a third contactor operably associated with said pulse width modulated inverter;

means to reconnect said pulse width modulated inverter to said permanent magnet turbogenerator/motor through said rectifier bridge to reconfigure said pulse width modulated inverter; and

means to connect said reconfigured pulse width modulated inverter to supply utility frequency voltage to a load through said third contactor when closed.

22. (Original) The controller for a permanent magnet turbogenerator/motor of claim 21 wherein the number of solid state switching device channels in said pulse width modulate inverter is four, and three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

23. (Original) The controller for a permanent magnet turbogenerator/motor of claim 22 wherein the four solid state switching device channels are IGBT channels.

24. (Original) The controller for a permanent magnet turbogenerator/motor of claim 21 wherein said rectifier bridge is a three phase rectifier having three diode channels.

25. (Original) The controller for a permanent magnet turbogenerator/motor of claim 24 wherein each of said three diode channels includes a pair of diodes.

26. (New) A method of controlling a turbogenerator/motor, comprising:
providing electrical power to the turbogenerator/motor through an inverter to start
the turbogenerator/motor to achieve self sustaining operation of the
turbogenerator/motor; and

reconfiguring the inverter to supply voltage from the turbogenerator/motor when self sustaining operation of the turbogenerator/motor is achieved.

27. (New) The method of claim 26, wherein reconfiguring the inverter comprises:

reconfiguring the inverter to supply utility frequency voltage from the turbogenerator/motor.

28. (New) The method of claim 26, wherein reconfiguring the inverter comprises:

reconfiguring an inverter including four solid state switching device channels wherein three of the four solid state switching device channels are reconfigured to supply utility frequency voltage and the fourth solid state switching device channel is switched at a fifty percent duty cycle to create an artificial neutral.

29. (New) The method of claim 26, wherein the turbogenerator/motor comprises:

a permanent magnet turbogenerator/motor.

30. (New) The method of claim 28, wherein the inverter comprises:

a pulse width modulated inverter.

31. (New) The method of claim 26, wherein reconfiguring the inverter comprises:

disconnecting the electrical power from the inverter when self sustaining operation of the turbogenerator/motor is achieved.

32. (New) A method of controlling a turbogenerator/motor comprising the steps of:

providing electrical power to the turbogenerator/motor through an inverter to drive the turbogenerator/motor as a motor to accelerate the turbine engine of the turbogenerator/motor;

providing spark and fuel to the turbine engine of the turbogenerator/motor during acceleration to achieve self sustaining operation of the turbine engine; and

reconnecting the inverter to the turbogenerator/motor through a rectifier to reconfigure the inverter to supply utility frequency voltage when self sustaining operation is achieved.

33. (New) The method of claim 32, wherein providing electrical power through an inverter comprises:

providing electrical power through an inverter including four solid state switching device channels; and

reconnecting the inverter comprises:

reconfiguring three of the four solid state switching device channels to supply utility frequency voltage; and

switching the fourth solid state switching device channel at a fifty percent duty cycle to create an artificial neutral.

34. (New) The method of claim 32, wherein the turbogenerator/motor comprises:

a permanent magnet turbogenerator/motor.

35. (New) The method of claim 34, wherein the inverter comprises:

a pulse width modulated inverter.

36. (New) The method of claim 32, wherein reconnecting the inverter comprises:

disconnecting the electrical power from the inverter when self sustaining operation is achieved.

37. (New) A method of controlling a turbogenerator/motor comprising:

providing electrical power to the turbogenerator/motor through a first contactor and an inverter to drive the turbogenerator/motor as a motor through a second contactor to accelerate the turbine engine of the turbogenerator/motor;

providing spark and fuel to the turbine engine of the turbogenerator/motor during acceleration to achieve self sustaining operation of the turbine engine; and

reconnecting the inverter to the turbogenerator/motor through a rectifier to reconfigure the inverter to supply utility frequency voltage when self sustaining operation is achieved.

38. (New) The method of claim 37, wherein providing electrical power through an inverter comprises:

providing electrical power through an inverter including four solid state switching device channels; and

reconnecting the inverter comprises:

reconfiguring three of the four solid state switching device channels to supply utility frequency voltage; and

switching the fourth solid state switching device channel at a fifty percent duty cycle to create an artificial neutral.

39. (New) The method of claim 37, further comprising:

connecting the reconfigured inverter to a load by closing a third contactor.

40. (New) A method of controlling a turbogenerator/motor comprising the steps of:

providing electrical power to the turbogenerator/motor through a first contactor and a multiple solid state switching device channel inverter to drive the turbogenerator/motor as a motor through a second contactor to accelerate the turbine engine of the turbogenerator/motor;

providing spark and fuel to the turbine engine of the turbogenerator/motor during acceleration to achieve self sustaining operation of the gas turbine engine;

reconnecting the inverter to the turbogenerator/motor through a rectifier to reconfigure the inverter when self sustaining operation is achieved; and

connecting the reconfigured inverter to utility power by closing a third contactor.

41. (New) The method of claim 40, wherein providing electrical power through a multiple solid state switching device channel inverter comprises:

providing electrical power through an inverter including four solid state switching device channels; and

reconnecting the inverter comprises:

reconfiguring three of the four solid state switching device channels to supply utility frequency voltage; and

switching the fourth solid state switching device channel at a fifty percent duty cycle to create an artificial neutral.

42. (New) The method of claim 41, wherein the four solid state switching device channels comprise:

IGBT channels.

43. (New) The method of claim 40, wherein the rectifier comprises:
a high frequency three phase rectifier bridge including three diode channels.

44. (New) The method of claim 43, wherein each of said three diode channels comprise:

two diodes.

45-231. (Canceled)